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AUTHOR Buchen, Irving H.
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ABSTRACT

A changed curriculum will be necessary for education in the future. Current social and demographic trends emphasize the need for futures studies and systems dynamics. Educational personnel must be aware of and understand social trends of increased information generation, numerical literacy, the growing importance of and dependence on machines, and the increase of complexity in institutions and systems. Education in and for the future must cover the present and future status of these trends. Reading, writing, and computation skills must be supplemented by skills students will need for the future. (SAS)

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CURRICULUM 2000: FUTURES BASICS

IRVING H. BUCHEN

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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CURRICULUM 2000: FUTURES BASICS

> Those societies which cannot combine reverence for their symbols with freedom for their revision must ultimately decay....
>
> Alfred North Whitehead

More than eighty percent of those currently alive will live to see the year 2000. More to the point here, high school graduates in June, 1981, will be only thirty-seven years old when the 21st century dawns. Kindergartners starting in September, 1981, will be only twenty-four. In other words, we already are educating the generation that will live a substantial portion of their productive lives in America's Third Century. So much then for being self-indulgent in focusing on the year 2000 ahead of time.

Such demographic projections often generate contrary impulses. On the one hand, there is the sense that whatever the future will bring, it will be different enough to force a re-examination of our curriculum priorities. On the other hand, there is the painful awareness that given the way education is structured or rigged little or nothing can be done to bring about any change, especially during periods of insecurity. But perhaps that latter scepticism needs some re-examination itself.

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All trends point to extensive in-service activities for public education and to considerable retraining for higher education for the next ten to fifteen years. (Between 1978 and 1990, for example, nationally there will be a decline of between 20 and 30 percent of the number of young adults, 17-21). Whether that inservice commitment will be officially characterized as "recertification" or be part of an enlightened tenure review policy, professional staff development is emerging as one of the most reasonable and comprehensive ways of dealing with a number of constraints acting on education. These include increasingly tenured, steady-state staff; declining enrollments often accompanied by correspondingly declining budgets; pressures for greater productivity (do more with less, or do more with the same amount); greater public pressure for performance against test results or master plans; and greater commitment to career education and Back to Basics.

The prospect of extensive retraining and redirection provides a rare historical opportunity to pause and to reflect over what has been done, with what results; and what should be considered to prepare students to live in the 21st century. But there is another, larger reason to pause at this point; to examine where education itself stands in the general projection of things to come, if for no other reason that we have to practice the futurism we profess for our students, on ourselves.

When forecasters seek to separate the sheep from the goats, the strong trends from the skittery ones, their dividing vocabulary

is that of probable futures on the high end and possible futures on the low end. Often the process of categorization stops there, but there is another category, usually reserved for and monopolized by dreamy humanists: and that is the notion of preferable futures. To be sure, it is distressing often to find that what is designated as highly probable stands far away from a future that to you is dearly preferable. Indeed, in methodological terms, the gulf between the two is generally characterized as the planning gap, for the aim of planning interventions is to bring preferable hopes at least in line with possible futures and closer to probable futures. Now education in the last few years and likely into the future has enjoyed the dubious distinction of regularly being at variance with the mainstream of probable trends. In other words, the dilemma of education can be defined as a regular gulf that exists between what probably will happen and what is needed to happen. Being regularly put off from the center of things undoubtedly accounts for the demoralizing attitude of many in education and for the increasing brain drain especially of younger teachers from the periphery of education to the center of business.

If, then, history is forcing upon us the involuntary options of being retrained, retooled and retreaded, we ought at least to respond in kind by having some say about what form and direction all that recreation will take. I would urge that the focus of that retraining should be preferable futures as in the long run the most realistic way of serving the future needs of students.

Teilhard de Chardin noted:

> Our modern world was created in less than 10,000 years, and in the last 200 years it has changed more than in all the preceding millenia. Have we ever thought what our planet will be like, psychologically, in a million years time? It is finally the Utopians, not the "realists," who make scientific sense.[1]

Having been stirred by such heady prophecy, we now have to settle down in harness and speculate about what kind of future we are likely to have by the year 2000; and given that prospect how well are we preparing students now for such a future, and what else might we be doing?

I

For our purposes here, it is not necessary to develop an elaborate and complete scenario for the year 2000, but rather to concentrate on those developments that will impact on education and, in turn, be impacted on by education. I will limit myself to five, the first being perhaps a scandalous disclaimer.

There is an incredible diversity of forecasts about the future, especially in the United States. Extremes are norms: zero-growth at one end of the spectrum to growth-orgy at the other. And in between are all sorts of adjusted positions: steady state, dynamic equilibrium, moderate growth, etc. The confusion is reflected in the related uncertainty as to what to call the future. We have a number of post-definitions: Bell's post-industrial; McLuhan's post-alphabet; Gappert's post-affluent

Mumford's post-historical. And so it goes. A rapid way of preserving that diversity but containing it is to employ the notion of simultaneous futures, or why can't they all be right somewhat?[2] After all, planners generally recognize that nothing ever happens uniformly or totally, and that at any given moment in time there are expanding, steady-state and declining futures; and that further the entire process can be averaged out, once properly weighted, to arrive at where most of us will be anyhow. But what is extremely important about this trend of strong and intense differences of opinion about the future, is that whereas a business, a governmental agency or a religious constituency may have to ultimately plunk down for one kind of future to plan for and bank on, education can never put all its eggs in one future basket; and still remain at least an advocate for the multiple and diverse interests of its students.

Given such heterogenity, subjected in turn to long-term multiplicity, the accountability of education has to be redefined as the futurability of education. For every current and projected new component of the curriculum, we have to ask to what extent does that piece aside from apparently being needed now have the future potential of being durable, flexible, and transferrable.[7] The additional value of the futurability of education as a new standard is that it would compel all educational research and evaluation to forsake the single shot, single issue approach and become longitudinal and clustered to be acceptable. In design terms, what this all boils down to is the

the notion of an adaptability curriculum for an uncertain future.[3] We have no other responsible choice, for if the experts, including this one, are wrong in what they project, and if curricula thrusts are based on those projections, then we may produce the ultimate form of irrelevant education and provide full justification for our previous ineptitude of regularly being off the mark. Finally, the commitment tc an adaptability curriculum may mean that the most forward-looking curriculum paradoxically may be the least futuristic in appearance. It may appear conservative, even reactionary, in its resurrection of self-reliance, although its linkage to the autonomous learner and group reliance may evidence its futuristic thrust.

The four remaining trends should not really be disaggregated for part of their power derives from their being so intertwined that they travel forward with the force of a reinforcing cluster, as Herman Kahn would call it, a multiform trend. The four ingredients of this configuration are the creation of an incredible information society; a rage for quantification approaching the worship of numeracy as the future version of literacy; the development of technologies that bring about a symbiotic equalization between machine and human beings; and finally the increase in institutions and systems of organized complexity. All these trends already surround us today but they will increase to the point where they will have the force of a difference not just of degree but of kind as well.

The creation of an information society without precedent in

history is being accompanied ironically by having less time and categories to absorb the new data and knowledge. Desperately, the increase in number of new specializations and disciplinary categories will continue and try to keep pace with the exponential explosion. There will also be more cross-disciplinary and cross-referenced information than ever before, although that proliferation will not be matched by a proportionate increase in the number of cross-disciplinary categories or disciplines. Part of this data and information overload stems from the field of education itself. The present generation of students are the most tested and surveyed generation of students in the history of public education. All indications are that the process will continue unless and until costs slow it down or stop it altogether.

As knowledge increases, there will be more knowledge obsolescence. In an information society that also means more people obsolescence. The notion of lifelong learning as an option of leisure will be obscured by the more pressing necessity of workers having to acquire more and more education and reeducation. Already in graduate education the trend of multiple masters degrees, especially to keep pace with middle level professionals, is already surfacing and soon will be increasingly accompanied by the upward mobility of two Ph. D's being required to certify expertise. In Western Europe, the opportunity of retraining has been negotiated as a right by labor unions for their workers displaced by productivity or shifting consumer preferences. If economic growth continues to be a modestly slow 1-2 percent per

year and if competition for jobs continues and even increases, then there will be a greater under-employment and greater under-utilization of education and ability--in short, the essential indicators of an overqualified society. A surplus of unproductive people, through no fault of their own, will thus be available to education which specializes in absorbing the unproductive, through no fault of its own.

Partly as a result of the information society, but also partly as a result of a host of other pressures--accountability, rigorous methodologies, pressures for validation and measurement, etc.--quantification has become and increasingly will become the norm. It already has entered the social sciences in a substantial and divisive way; a new journal appeared entitled Quantitative Sociology. The Journal of Communications published by the prestigious Annenberg School of Communications at the University of Pennsylvania will not even consider let alone accept articles that are purely descriptive and analytical unless they are accompanied by statistical buttressing. In a shortfall economy, numbers rule the day. Not too long ago in New York City during budget review time, it was rumored that the various borough arts councils would be cut to the bone. An enterprising retired executive began a series of calculations on the impact of the arts--theater, ballet, opera, galleries, etc.--on employment, hotels, restaurants, etc. And for the annual investment of $200,000. for all the boroughs he was able to post a nearly four billion dollar impact or yield--a record no other department

could rival. The traditional cries of preserving the arts against encroachments of the BIG MAC philistines evidently no longer can be counted on to carry the say. The numbers can and did.

The trend toward numbers like digital watches and calculators is unmistakable. Indeed, my judgment is that there will be proportionately more use of quantification by the social sciences in the future than by the traditional hard sciences. The new priority assigned to numerical measurement and accountability is undoubtedly related to the discovery of limits--of limits to growth, caps to budgets, constraints on new appointments and programs, limits to debt, limits to taxes. Proposition 13, please note, is a concept expressed as a number; and what it has to do with is numerical as well. In short, whatever the fate of literacy, from a futures point of view we are entering an Age of Numeracy, which in turn exists in an unholy or holy alliance, depending on your points of view, with the Age of Technology.

What should be made clear from the outset is that the moment we designate technology as a crucial driving force in its own right what we are signifying is that the machine has gone beyond the category of being an obedient servant. In other words, we are essentially describing an equalizing process in which machines begin to occupy a shared status with the humans who create them. The computer provides an excellent example. The first generation of computers--it is significant that we now apply to computers a term normally reserved for human beings--was given problems to

solve which we knew were solveable but which would require twelve mathematicians working six months and then four additional mathematicians another six months to find the errors made by some or all of the twelve. Here the computer was really used as a mundane slave--doing the dirty work that we would not stoop to. Gradually, as the programming of the mechanical brain became more sophisticated, we sought to put upon the computer capacities which exceeded our own, in particular the capacity to juggle a number of variables at the same time. We succeeded here but it went beyond our expectations. Ordinarily, the computer so programmed would be merely a mechanical extension of our own ability. But what the computer did that we did not expect is that it began to tell us something we did not know. Specifically, in the process of juggling those many variables, which we thought were essentially constant, we discovered some discrepancies which ultimately revealed that some of the variables were leaky. They were not tight containers or orbital systems that remained fixed; moreover, they dribbled onto other variables and altered them in turn. The result is that we not only learned what we wanted to know, but we learned more than we bargained for.[4] We had invented not a tool but a partner; and the moment that occurred human beings were poised for a future in which in addition to all the interpersonal and intergenerational relationships they had to form, they now had also to prepare themselves for a futuristic relationship--a symbiotic one with machines. In fact, I believe that already there are an increasing number of people who have formed better relationships with machines than with human beings, and in the

future the competition for relationships between people and people may be less intense than the competition between people and machines. That machines could be that attractive is not surprising to Arthur C. Clarke who once quipped that if a war would ever break out between men and machines, it would not be difficult to guess who started it.[5]

Finally, there is the long-standing trend which shows no signs of abatement--the increasing complexification of the world. By this is not meant solely the familiar notion that because we know more the world is denser. Rather, that because we know more our institutions and organizations have become denser. Warren Weaven calls the products of this structural replication, systems of organized complexity. Before him, Mumford with less pretense to objectivity dubbed them pejoratively megamachines. Modern corporations, with or without their multi-national counterparts, have become enormously complex, diverse and interlocking--a series of incredible super-structures. Similarly, separate sectors of the society and the economy move about with the thump of a colossus--the banking system, the insurance industry, the social security system, the United Automobile Workers, the telecommunications networks, etc. Much of the recent density of the last ten years has been the result of acquisitions--of each major corporation diversifying so as to minimize risk and optimize investment and profits. The net effect is that many major corporations are little worlds--miniatures of the world at large in all its variety

and extent. The relative macro sameness of these variegated megamachines has accommodated another parallel managerial development. Originally, presidents of automobile companies began in the industry and worked their way to the top. That still happens or can happen but the dramatic managerial change is the appointment of an executive from the plywood field to run a major domestic airlines. That kind of cross-over is accommodated by a new managerial transferability on the one hand and by intense commonality of organizational structures on the other. Finally, megamachines have become more complex as the environment has become more sophisticated. It is as if the symbiotic relationship postulated between human and machines has been carried over to that between institutions and institutional environments.[6] The symbiosis in this instance takes the form of converting external changes of complexity into internal versions of matching density. Now although it is true that men made megamachines it is more true to say now and in the future that megamachines make megamachine men. That may or may not be sinister, but what clearly has to be underscored for the future of students and of their education is that more and more people will be employed by structures of organized complexity and that somewhere in the curriculum it might be as important to dissect a megamachine as a frog.

If the outcome of the first trend on uncertainty was to place considerable emphasis on adaptability, then the four remaining trends describe what it may be necessary to adapt to. Moreover, because these four trends are so enormous and reinforcing, and by

comparison we appear so small and ill-equipped, the goal of adaptability has to evidence flexibility itself; specifically it should accommodate a sliding adjustable scale ranging from the minimum to the optimum. Thus, the first concern is how do we cope, then how do we keep up, then how do we manage and finally how do we direct the future? But first we have to take stock and determine whether in light of these four trends what we are currently doing and plan to be doing is keeping us abreast or are we going up a down escalator?

II

Ideally every school should be a miniature information society. It is not for two basic reasons. First, it thinks it is, primarily because it has a library and because it teaches library skills. The inadequacy of that assumption appears regularly whenever a publisher or curriculum developer in addition to standard texts and materials provides data packets or information banks which either exceed the holdings of the library or the research capacity of the school to extract such information from current holdings. Second, the critical capacity is increasingly being devaluated. More schools appear to be putting a higher value upon expression than analysis--on encouraging students to say what they believe and feel rather than to think what they believe and feel. Indeed, it has become fashionable to ridicule anyone who thinks, and especially anyone who thinks in terms of data, by having him speak or sound like a computer. The net result

is that as far as the projected information society is concerned, the future is gaining ground faster than we are catching up.

I will concede that the stress on computational skills as part of basics and the number of students who have taken courses in computer science are encouraging signs that the second trend, that of increasing quantification, is being faced more directly. Gains however in high school often are offset by humanists in college still talking about dehumanization without being aware that they are educating a new generation of students who have been exposed to computers and lo and behold have not been mechanized. But here, too, the entire matter is too chancy. For example, how many of the current social science teachers, especially of the older more descriptive school, will welcome and incorporate the new stress on quantification? Then, too, how much attention will be given to such basic computational and statistical skills as compiling budgets, miles per gallon and depreciation, the long form of the income tax, the deductions from one's paycheck, the computation of interest charges, the nature of insurance premiums and dividends, pension and social security plans, etc? What is not generally known and what is even less often examined is the federal budget (or a piece of it). When the president presents that budget, two institutions, aside from Congress, immediately begin to engage it: The Brookings Institution and the Urban League. And because their versions of what the national budget should be are often drastically different, what immediately becomes clear is that whatever accounting or

quantification skills may be required, a budget is a national priority system in that one puts one's money where one's values are.

As far as technology is concerned, the beast is here to stay and curiously the more one accepts and understands the monster the more benevolent it seems. I think the basic problem is that there is pervasive technophobia among the humanities and social science faculty, and an embrasive technocracy among the scientific faculty. A number of years ago C.P. Snow described that contrast as the conflict between the two cultures, and whether or not this century will yet see the convergence of those two cultures what is clearly needed is the creation of the new category of "Technological Literacy" as minimum knowledge required to be a reasonably educated or civilized human being. In fact, never before has the knowledge of machines been such an important condition for the knowledge of being human.

Finally, hardly anywhere in any curriculum, including at the college level, is there a systematic study of key institutions of organized complexity, how the megamachines eat, digest, reproduce and excrete; how they move and grow and expand; how they celebrate and reward and punish; how they psychologically stay sane and handle conflicts and infidelities and divorce, etc. We need to personalize these complex structures so as to make them amenable to some sort of analysis and appreciation, especially for the increasing number of students who may find themselves part of that structural complexity.

I would not identify all these problems or gaps if I did not

have some solutions and bridges to propose; and I should like to approach that by saying a word or two about back to basics, especially since I have been a bit sneering about that current obsession.

My judgment is that if all the goals of the Back to Basics movement could be achieved by tomorrow morning (instead of within the next ten to fifteen years) that would still leave the bulk of students seriously unprepared for living the future as I have projected it. But lest you conclude wrongly that I think Back to Basics is one great step backward for mankind, not at all. My criticism is that it is too timid. It stopped short of what it should advocated--what I call futures basics. My rationale for including these futures-oriented basics as part of Curriculum 2000 is the notion of leap-frogging: while we are catching up let us also try to leap ahead. What I also wish to make absolutely clear lest what I am about to say will be totally ignored by so-called hard-nosed realists, is that what I am proposing by future basics is implementable without dispossessing or dislodging any substantial portion of the current curriculum. In other words, what I am proposing is an overlay of different kinds of organizing principles over existing content--in short, a series of process disciplines, which are durable, flexible and transferable.

III

The three components of futures basics, frameworks, methodologies and values, are offered as a "package" because, like the

trends they have to confront and manage they, too, exist as a reinforcing cluster. Although they are sequenced so as to nest within each other, each on a smaller more intimate scale, they are all equal in importance. Indeed, each component would be not only impoverished but even imperilled if it sought to transcend or privilege itself over the others. Thus, no framework can sustain its holding power if it fails to support and accommodate methodological rigor and values judgments. Nevertheless, frameworks are not first because they dramatize the entire issue of form being in jeopardy.

When things change rapidly and discontinuously, one of the most significant signs of the time being out of joint is that forms--social, political, economic, aesthetic--lose their containing power. Vessels that used to hold water leak like sieves; and official or traditional explanations no longer appear to engage what they purport to define. The current need now and for the foreseeable future is for binders, stitchers, connectors--in short, for what rhetorically is called coherence. Although there are many sources, both old and new, that can be turned to for coherence, I am partial to two that have emerged since World War II and that have about them the promise of futures durability, flexibility and transferability: first, the notion of Systems Dynamics and second, that of behaviorial engineering. When converged they produce a powerful Behavior of Systems or how things work not only in themselves but in interaction and modification with other things.

I value systems dynamics for the number of supports it provides in the quest for coherence. Most obviously, it studies the dynamics, the actual ebb and flow, starts and stops, of all kinds of activities and operations. It also compels an understanding of causes not just symptoms because it invariably involves modeling of how things function or dysfunction. But for our purposes what is most important is that the approach is holistic. Systems analysis courageously leads wherever the system operates and is no obedient respector od disciplinary boundaries, institutional turf, or formal protocols. Thus, when a missile succeeds or fails at Cape Kennedy, how is responsibility fixed? With the private firm of General Dynamics, with a private university,MIT,receiving public research funds, with the Pentagon? The fact is that both in concept and operation couplings and relationships are more important than organizational charts if one is genuinely interested in the truth, the whole truth and nothing but the truth. The capacity to go behind and beyond institutional facades in order to discover and define the process that binds together public, private, quasi-public, quasi-private agencies in a holy or unholy alliance in the first place, is essentially what distinguishes the holistic approach of systems dynamics from conventional piece-meal analysis.

The alliance with Skinner to produce the composite frameworks of behavioral systems is sought because behavioral modification adds at least three special dimensions, especially for education. First, it ties systems behavior to human behavior,

both individual and group, and thus personalizes and socializes the process of study and outcome. Second, Skinner studies in order to act; he does not care to engage in elaborate theoretical debates about whether children are born basically good or evil; all he asks is that you give him the children. In short, the study of change is justified by a conscious desire to change--to modify and alter behavior. The Skinnerian addition thus compels the model to be receptive to interventions and goals-infusions. Finally, Skinner assures bilateralism--namely, the awareness that although one is modified by the system one also modifies or can in turn modify the system.

A semester long in-service course would be sufficient to provide the essential grounding in behavioral systems as a frame-working process. What also would be stressed there would be adjustments to scale. Each single inquiry would be scaled so that as one advances, the system examined turns out to be partial not whole when repositioned within larger, more inclusive systems. Similarly, the modeling process, which is a rigorous form of structural access, can be designed so that it slides into computer simulation, a procedure that currently enables us to model the digestive process of the stomach, the variables of voter preference, the pollution capacity of 200 miles of the Atlantic Ocean, how and why learning does or does not take place, and eye movements as they scan a painting and dynamically produce another "picture" that portrays the structural cues of the work. Finally, in this connection even the very pure and highly respected

Creative Education Foundation of SUNY, Buffalo, now provides as part of its creativity offerings, General Systems Models and Futures.

If the function of frameworks is to generate coherence or miniature wholes, the function of the second component, methodologies, is to structure inquiry and to identify the actors in the system. Both components are designed to function as macrocosm and microcosm, respectively, but to do so in a relationship of equality. The larger framework must not be allowed to trivialize the hardworking methodologies which provide the system with its content; nor obviously should the data-generating process forget the larger reasons why the information is being gathered in the first place. Above all, it is with methodologies that the leap-frogging strategy applies--the notion of trying to get ahead while catching up--for it is here where the information overload, the rage for numeracy and the increasing creation of megamachines are engaged.

The basic skills of reading, writing and computation have to be supplemented by futures skills that better equip students in a race against information production. Thus, we need to teach not only reading, but also speed reading, memory training, listening skills, recall skills, concentration techniques, etc. We need to teach not only writing, but also note-taking, visual-thinking, outlining, precis, abstraction, epigramming, test-taking and test-design skills. We need to teach not only mathematics, but also budgeting, graphing, statistics, income tax tables, cost-benefits determinations, catastrophe theory, etc.

All these basic and future skills prime students as mental athletes and prepare them for more advanced and rigorous methodologies. But such subsequent progress is accompanied by extensive resource experiences which compel every student to become an informationist. Specifically, what have been traditionally designated as library and research skills have to be supplemented or recast into an expanded information resource techniques. A taxonomy of information sources would be compiled, calibrated to minimum--optimum needs by grade level, and would range from books to data retrieval, from audio cassettes to video discs. Equally as important, information systems would be examined--how the census, for example, is assembled; how public opinion is sampled; what economic indicators are used to determine cost-of-living adjustments--and what constitutes clean and dirty data, what are legitimate margins of error, etc. The more advanced methodologies that would follow or accompany these information experiences would include problem-stating and problem-solving techniques, decision-making theory and process and above all anticipatory or forecasting skills. Aside from being rigorous and transferrable in their own right, all these techniques have the special advantage of being explicitly fact-finding and research-oriented. Each methodology thus compels identification of the comprehensive and precise research and information needs of each problem, decision or forecast under consideration, and thus insures extensive and intelligent use of the information sources noted above.

My transparent partiality to futures as a key methodology

is in turn based on an arrogant assumption that if you employ two groups that are essentially equally bright, come from the same socio-economic mix, etc. and have one group study the curriculum as is and another the futures dimensions of that curriculum, the futures group will turn out to be smarter. The rationale for that conclusion is that you cannot forecast what you do not understand; or it is easier to fudge when you do not have to replicate. Adding on or building in a futures dimensions provides the future with access to the present and thus can render naked an ignorant or inadequate base from which to forecast. In fact, research has demonstrated conclusively that a problem-solving methodology which employs both decomposition and a futures dimensions can effectively teach students how to break a problem or data mass down into meaningfully sequenced parts and improve their forecasting ability. One recent piece of research used two groups: one was given the single question: "How many packs of Polaroid color film were used in the United States in 1970?" The other received the following decomposed version:

1. How many people were living in the U.S. in 1970?
2. What was the average size of the family?
3. What percentage of families owned cameras?
4. Of these, what percentage owned Polaroid cameras?
5. What was the average number of packs of film used per Polaroid camera owner?
6. What percentage of Polaroid film sales were color film?

Decomposition disaggregates the ingredients so that you know what went into the present cake and if you are looking toward the future, what adjustments in amounts you will have to make to make a bigger or smaller cake. (incidentally, answers to four of

the above questions could be found in the World Almanac).

While I am being this transparent about my future bias, I also should confess that behind my advocacy of the systems and behavioral approach as well as the skills base to feed that framework, there has been a subversive aim. Throughout my discussion I have scrupulously avoided mentioning any specific subject areas. The reason is that I am after bigger game: the inter-relationships between subject areas. Most interdisciplinary efforts have failed or been unproductive because the alliances were not preceded by a methodological inventory. That is, the methodologies of the participating disciplines often were not explicitly identified, and as a result, a secret counter-productive force frequently was operating beneath the level of subject matter alignment that compromised the extent and nature of the cross-disciplinary interaction. My judgment is that the systems framework coupled with a number of the methodologies to buttress it, can in fact bridge a number if not all disciplines with a commonality of reference points, terms, and tools that in turn can serve to accommodate the special methodologies used by each of them. Indeed, one of the most important futures direction of education may be the interacting and interfacing of methodologies from multiple disciplines. Only after such a courtship period, would it be proper for interdisciplinary marriages to take place.

While the confessional mantle is upon me, let me talk with equal candor about strategy. The predictable indicator that a panacea is about to be delivered is the creation of absolutist

pre-conditions. In education, in particular, the halls ring with the cry, "Scrap everything and start afresh." The current system, so the argument continues, is really so compromised or corrupt that nothing can be accomplished trying to work with or within it; what is needed is a blank slate. (Incidentally, the notion of the tabula rasa, like that of the Ivory Tower and objectivity, is a supreme fiction). Obviously, I have not called for storming of the Bastille for three very good reasons. First, once I decide that I have something to say (and I don't always have something to say), I should like to be listened to, taken seriously and even more hopefully implemented. And I do not think that will happen if I not so gently propose that everything and everyone in public education disappear. Second, if there is in fact all that rotten wood then what I am urging as an overlay would come down with sufficient weight to cause what is weak to give way. But the third reason is the most important and hopefully redeems my calculating political strategy. If I design and deliver a finished curriculum rather than a curriculum overlay or model, then no matter how bright and wise and anticipatory I am, what you will have will be singularly prescriptive and bear all the limitations of the designer. Moreover, there is the double irony of curriculum developers, learning from the fleshing out process, but being denied access to the classroom; juxtaposed with teachers who are in the classroom but denied access to the curriculum development process. Thus, the supreme value always of a curriculum model rather than a developed curriculum is that when it is

taken up by many the results will not be singular but multiple, and it will be fleshed and variegated by those closest to the point of implementation, evaluation, monitoring and revision. In short, the capacity for adaptability cannot be offered effectively to students if it is denied to teachers.

The third and last component involves values, and here I have nothing original or unique to add to existing materials on values clarifications, but I would like to call your attention to education as a special values field, a perspective perhaps that has been forgotten or obscured of late.

If there is such a thing in this country as a secular theology which regularly makes pronouncements, I think education might qualify. The reason is not hard to find. When the Secretary of Agriculture is asked to explain the way farm parities work so that farmers are paid to produce less or nothing with the net result that people in the United States like senior citizens who are on a fixed income and can't afford those prices are eating pet food, all the secretary is concerned with is the precision of his description. But a teacher, hopefully of economics, invariably says, "That's terrible!" As long as educators keep saying "That's terrible!" education can function not only as a significant social critic, but also properly educate its students as future social critics.

One of the most effective ways to make education value-laden or ethically charged is for subject matter to be issue-oriented. Issue-oriented education is frequently polarizing--debatable,

arguable perhaps even ultimately uncompromisable or unresolveable. Aside from stirring the juices, the worth of such exchanges is that values do not sort themselves out into conflicts between right and wrong, but into conflicts between right and right. And those kind of conflicts, which characterize most of the major differences of opinion in a democracy, are the hardest to handle and to solve, and ultimately require a blend of knowledge and judgment which is education's supreme contribution to citizenry.

But there is another equally important reason for advocating issue-oriented education from a values point of view. It is invariably anticipatory. That is, every crisis was originally a problem that was not first identified as an issue. Issue-oriented education can follow the law of escalation as it works an issue up to a problem and then in turn aggravates that up to a crisis. The potential for such a counter-productive progression according to the law of diminishing options directly taps the systems and methodological capacity of futures basics. Moreover, it is linked to the values exercise because escalation of this kind underscores the major failure to examine the consequences of one's actions, including one's inaction. And such a failure, from a future's point of view, is immoral. As such, it enables education to say unequivocally, "That's terrible! And we cannot let it happen. We have to address this issue before it gets out of hand." The moment teachers make that kind of comment, education has engaged the future of the future.